



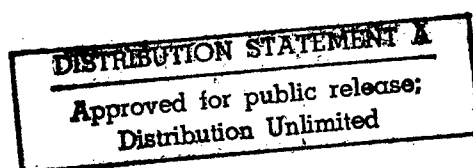
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JPRS Report

Science & Technology

***Central Eurasia:
Life Sciences***

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Science & Technology

Central Eurasia: Life Sciences

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Luminescence of Ca^{2+} -Activated Photoprotein Obelin Under Influence of Active Forms of Oxygen

927C0381B Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 321 No 4, Dec 91 (manuscript received 23 Sep 91) pp 850-854

[Article by Ye. S. Vysotskiy, V. S. Bondar, K. P. Trofimov, and I. I. Gitelzon, Biophysics Institute, Siberian Department, USSR Academy of Sciences, Krasnoyarsk; UDC 577.352.4]

[Abstract] The calcium-activated photoprotein obelin was employed to determine whether Ca^{2+} -activated photoproteins that bind Mn^{2+} ions can also radiate light in the presence of active oxygen metabolites. The obelin was obtained from the marine bioluminescent hydroid polyp *Obelia longissima*. Obelin luminescence was observed in a calcium-free medium in the presence of the $\cdot\text{OCl}$ anion. It was shown that adding Mn^{2+} ions to the medium amplifies the intensity of luminescence more than 100-fold; however, in the absence of $\cdot\text{OCl}$ anions the Mn^{2+} ions do not stimulate obelin luminescence. The effect of different substances capable of selective neutralization of active oxygen forms was investigated to explain which active oxygen forms were involved in obelin luminescence. The results demonstrated that the luminescence of the photoprotein under the influence of the $\cdot\text{OCl}$ anion in the absence or presence of Mn^{2+} was not related to the superoxide radical. Sodium azide and histidine, which inhibit $\cdot\text{OCl}$ -dependent luminescence of obelin in the presence and absence of Mn^{2+} ions, were used as quenching agents of singlet oxygen. The data suggest that when the $\cdot\text{OCl}$ anion is added, singlet oxygen is generated, which causes the luminescence of obelin as a result of secondary processes. The findings also showed that the revealed effect is not related to Ca^{2+} contaminants. In conclusion, the luminescence of the Ca^{2+} -activated photoprotein obelin can be initiated by Ca^{2+} ions and the $\cdot\text{OCl}$ anion; Mn^{2+} ions amplify the intensity

of luminescence. However, the results also suggest that it is singlet oxygen rather than the $\cdot\text{OCl}$ anion that causes obelin luminescence. Figures 3; tables 1; references 8: 3 Russian, 5 Western.

Very Stable Polymeric Liposomes Based on Diene-Containing Phosphatidylcholine

927C0381C Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 321 No 5, Dec 91 (manuscript received 21 Oct 91) pp 1103-1105

[Article by A. V. Anikin, V. V. Chupin, M. V. Anikin, G. A. Serebrennikova, and R. P. Yevstigneyeva, Moscow Fine Chemical Technology Institute imeni M. V. Lomonosov; UDC 577.3]

[Abstract] This paper presents a novel phospholipid capable of polymerization. 1,2-Di-(tetradeca-11,13-dienoyl)-*sn*-glycero-3-phosphocholine (DTDPC) contains conjugated diene groups on the ends of fatty acids as polymerizing fragments. DTDPC is synthesized by acylation of a cadmium adduct of *sn*-glycero-3-phosphocholine with tetradeca-11,13-diene acid anhydride. Polymerization occurs by incubating the liposomes at room temperature or 60°C or by gamma or ultraviolet irradiation. The data showed that the diene groups of DTDPC in the lipid bilayer displayed a high tendency to polymerize. ^{31}P -Nuclear magnetic resonance spectroscopy employed to explain the structural organization of polymeric membranes showed that the bilayer organization of polymeric liposomes is preserved in the presence of detergents and organic solvents in quantities exceeding those necessary to degrade monomeric liposomes. The results also demonstrated that the stability of the DTDPC polymeric liposomes is not dependent on the method of polymerization. It is believed that this phosphatidylcholine will find application in both research and development. Figures 3; references 10: 2 Russian, 8 Western.

Small Experts and Internal Conflicts in Teachable Neuron Systems

927C0375B Moscow DOKLADY AKADEMII NAUK
SSSR in Russian Vol 320 No 1, Sep 91 (manuscript
received 26 Apr 91) pp 220-223

[Article by S. Ye. Gilev, A. N. Gorban, and Ye. M. Mirkes, Computing Center, Siberian Department, USSR Academy of Sciences; Biophysics Institute, Siberian Department, USSR Academy of Sciences, Krasnoyarsk; UDC 576.7]

[Abstract] This paper examines hierarchal neuron systems consisting of small system experts and presents algorithms for rapid parallel instruction. The idea of this system of experts is that several systems learn the solution to problems and instruction is separated into "fields of competence". This system has an adaptive matrix of signal reception in which incoming signals are sent to

input neurons through adaptive summators. The objective of contrasting matrix A is to determine the most significant parameters and force the rest to zero. In addition, instruction develops in three phases: initial instruction, contrasting, and perfect knowledge of the contrasted network. In the case of sequential instruction of experts, the demands made of the expert are less than those which preceding experts experienced. With parallel instruction of experts the problem is separated into fields of competence, and the expert should accurately solve the problem in his field. Serious errors should not be made by the experts in any case, regardless of the field of competence. The results of test problems demonstrated that this approach increases the information capacity of the system and accelerates instruction. However, it is not known how far the understanding of actual neuron systems will be advanced. References 9: 6 Russian, 3 Western.

Sudden Mass Death of Crows Unexplained

927C0400 Moscow *MEDITSINSKAYA GAZETA*
in Russian 8 April 92 p 7

[Article by A. Prokin, dateline Voronezh: "The Crows Were Just Flying..."]

[Text] It was a whole flock of crows. Cawing loudly, they flew over the city and then suddenly fell lifelessly to the ground. Death took nearly 100 of the feathered creatures all at once.

According to the calls of disturbed residents, the veterinary service had given an explanation of the causes of the incident—an unknown infection had arrived with the birds all of a sudden. But they were unable to identify the infectious disease. And the way it showed up was so incredible—the birds dying all at exactly the same time. It would be more logical to assume something else: the birds encountered some harmful waste released into the atmosphere by some enterprise. They flew into the invisible cloud, and...

No accidental releases had been recorded at the city health-epidemiological inspection center that day. But the possibility can't be precluded. Because the service simply doesn't have enough equipment to monitor everyone for massive violations and the fact that the situation with the ecology is far from clear is evidenced by things like the following. Last year, out of 2,667 air samples taken by the health service, levels of harmful

substances that exceeded maximum allowable concentrations were recorded in 190. Add to that the fact that the water that the people of the city drink is far from being safe. In a number of districts, it does not meet GOST [All-Union State Standard] standards.

Nearly 5,000 fines were levied last year by health service workers on various managers. A total of 15 reports of illegalities were transferred to the procurator's office. But change comes slowly. Health physicians recently closed a new thermoelastoplastics shop at the Kirov Synthetic Rubber Plant. The reason: large releases of poisonous substances into the atmosphere. But you can't fine the workers at the enterprise. So the violations continue.

The psychology of the "state" managers is apparently such that payment out of the state pocket doesn't bother them. Perhaps privatization would help here. It was recently pointed out in PYATOYE KOLESO that a newly made millionaire who intended to buy a plant for the production of crystal made his first large capital investment in purification equipment. He was afraid that the health service wouldn't hesitate to shut him, a private businessman, down.

But for now, the Voronezh residents are racking their brains over the question, if the crows, creatures of plain taste, can't endure this, then how long will people be able to live with it? By the way, judging from the information coming in from various regions, that kind of question is facing many of the urban dwellers today of our long-suffering country.

Expression of Puromycin-N-Acetyltransferase Gene From *Streptomyces alboniger* in *Arabidopsis thaliana* Cells. Novel Marker for Selection of Transgenic Plants

927C0375A Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 320 No 1, Sep 91 (manuscript received 26 Jun 91) pp 216-219

[Article by E. K. Mukhamedshin, M. G. Kubaneyshvili, and T. Z. Didishvili, General Genetics Institute imeni N. I. Vavilov, USSR Academy of Sciences, Moscow; UDC 577.21]

[Abstract] Binary vector pV17 bearing kanamycin- and puromycin-resistance genes and the β -glucuronidase gene was constructed for inserting the puromycin-resistance gene into *Arabidopsis thaliana* cells to investigate the effect of puromycin-N-acetyltransferase (*pac*) gene expression on the level of puromycin resistance in *A. thaliana* plants. Southern blot hybridization of the DNA from F₂ Km^RGUS⁺-sprouts of two resultant transgenic lines revealed that one and two copies of T-DNA with kanamycin- and puromycin-resistance genes were integrated into the *A. thaliana* genome. The results showed that *Arabidopsis* cells, like animal cells, are sensitive to puromycin, and the expression of the *pac* gene sharply increases their resistance to the antibiotic. It was also demonstrated that the resistance trait is displayed by the entire sprout and is passed on to the next generation. Investigation of the feasibility of using the Pur^R marker for primary direct selection of transgenic *A. thaliana* plants revealed that with transformation by plasmid pV17, up to 100 percent of the explants form a fast-growing callus resistant to puromycin. In conclusion, the results confirm that the *pac* gene can be used for the direct selection of transgenic *A. thaliana* plants and for the secondary screening of transformants. Since the *pac* gene does not cross react with other antibiotics, it can be used in the selection of transgenic plants whose cells are normally resistant to kanamycin, methotrexate, or hygromycin B. Figures 4; references 10: 2 Russian, 8 Western.

Selection for Decreased and Increased Spontaneous Karyotype Instability in Cellular Populations of Myeloma SP2/0 in Mice

927C0378A Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 320 No 4, Oct 91 (manuscript received 26 Jul 91) pp 1000-1002

[Article by V. Yu. Kravtsov, A. F. Yakovlev, Ye. V. Fedorova, and Yu. B. Vakhtin, All-Union Scientific Research Institute of Stock Animal Breeding and Genetics, All-Union Academy of Agricultural Sciences imeni V. I. Lenin, St. Petersburg-Pushkin; Cytology Institute, USSR Academy of Sciences, St. Petersburg; UDC 576.616-006]

[Abstract] The objective of this study was to investigate the effectiveness of artificial selection for increasing and decreasing the frequency of cells with micronuclei in cellular populations of myeloma SP2/0. Suspensions of isolated cells of myeloma SP2/0 were injected into the intraperitoneal nodes of female BALB/c mice. Animals displaying signs of ascites were sacrificed 12-14 days later and intraperitoneal nodes (two to three mm in diameter) from the intestine and mesentery were prepared. The results demonstrated that the average frequency of cells with micronuclei in the intraperitoneal nodes at the zero cycle of selection was 2.1 percent. Selection for decreasing the frequency of cells with micronuclei reduced the average frequency to 0.6 percent, while attempts to increase the frequency of cells with micronuclei did not significantly alter this index. In conclusion, the data demonstrate that the degree of myeloma karyotype instability, as determined by the frequency of cells with micronuclei, can be reduced by 3-3.5 times by means of artificial selection, which results in considerable stabilization of the karyotype structure of populations. The findings suggest that the resultant myelomas with a lower degree of karyotype instability may be of considerable interest for producing hybridomas that secrete large quantities of monoclonal antibodies. Figures 2; references 9: 5 Russian, 4 Western.

Russian Deaths Exceed Births

927C0359A Moscow IZVESTIYA in Russian
31 Mar 92 p 2

[Article by Irina Demchenko, under the title: "Death Rate Exceeds the Birth Rate in Russia for the First Time Since the War"; under the rubric: "Events and Commentary"]

[Text] According to the data of the State Committee on Statistics [Goskomstat], the birth rate has dropped 30 percent in the last five years.

The number of those dying in November of the past year exceeded the number of those born in the Republic by four thousand for the first time since the Great Patriotic War and in December, by 12 thousand. In January 1992, 167 thousand people died and 147.3 thousand were born. The gap became still greater in February-March. The State Committee on Statistics of the RF [Russian Federation] has recorded a decrease in the number of inhabitants in 1992 as a result of so-called "natural attrition" in 44 territories of Russia in which more than two-thirds of its population lives.

The situation is especially severe in the large and ecologically unfavorable cities. The number of diseases of children in the first year of life, diseases associated with disorders of nutrition, increased. The most widespread of these are those which were characteristic for the war and postwar generations: severe rickets, diatheses and other allergic dermatoses, failure to thrive, disorders of the functioning of the gastrointestinal system, and obesity. Even on the basis of official statistics, which ignores many signs that were previously assigned to the category of diseases, only about a third of newborns have maintained their health by one year of age. Physicians have noted that parents do not have the time to visit the polyclinics and do not have energy or means to treat their children.

S. Reshetnikov, one of the directors of the small "infant" enterprise which opened recently in Moscow pediatric polyclinic No. 111, states that in a month and half only about 150 parents, despite the carrying capacity of the equipment of 600 calculations per day, visited his firm, which is engaged, in particular, in the gratis calculation of the daily diet for each particular newborn depending up its age, weight, and the amount of the mother's breast milk. Even after the firm as a charitable action began also to issue to its clients free baby food, which is in short supply in Moscow, the number of visits hardly increased.

"We guarantee," states S. Reshetnikov, "that if parents follow our recommendations, and come to us regularly, once a month, to set up a new menu for the infant, in 90 cases out of 100 the child, even if premature, will not have problems or illnesses provoked by incorrect nutrition. However, we have grave doubts that our appeals that concern be shown for the child's health, even if it does not cost money, can at this point attract the attention of parents. If there is the space there is a possibility we would perhaps open a meat department or

a commercial store nearby, so that people would drop in at the same time. People are so loaded down with their own problems that they cannot stand it. As to children, they just throw up their hands."

The statistical data suggest that the death rate has ceased to decline among newborns in Russia starting in 1989. The death rate of children up to a year of age was 9 percent higher in January 1992 than in January 1991. According to the forecast of the RF State Committee on Statistics, the birth rate will decrease over the course of 1992 by another 9 to 10 percent. This evidently absolutely normal reaction of society to a socioeconomic and political crisis may have more serious consequences than the supposed threat of a civil war.

Sanatorium Transferred From Trade Union to Resort

927C0359B Moscow SOVETSKAYA ROSSIYA
in Russian 24 Mar 92 p 2

[Article by unattributed author, under the title: "An Epidemic of Conflicts"; under the rubric: "The Gri-maces of Privatization"]

[Text] The news that the health center, famous beyond the borders of the city, has been deprived of its independence, has plunged the collective of the Lipetsk Balneofangothérapeutic Clinic into a state of shock. The complex, equipped with pools and unique apparatus, will become a structural subdivision of another medical institution, the Lipetsk Spa, by decision of the Presidium of the Regional Trade Unions Council.

"Our health center is the property of the trade unions," notes Pavel Protsenko, Chief Physician of the Balneofangothérapeutic Clinic. "But this does not imply that the defenders of the rights of the workers can, by changing the status of the institution, ignore the opinion of the collective. The Presidium of the Regional Trade Unions Council has not wanted to reckon with us. As a result a conflict has arisen, which like a chronic disease will not so quickly yield to treatment."

A mass epidemic of such malaise has encompassed Lipetsk Oblast with the beginning of privatization. Tens of collectives have been drawn into quarrels over property.

Stomatologist on State of Dental Service

927C0365A Moscow PODMOSKOVYE in Russian
11 Jan 92 p 5

[Interview with Prof Ye. V. Borovskiy, director of the polyclinic department of the Central Scientific Research Institute of Stomatology of the USSR Ministry of Health, by correspondent Igor Dmitriyev; date and place not given: "Thrust and Parry"]

[Text] Who is not familiar with toothaches? A sleepless night, a bandaged jaw, the line at the dentist's office, and if you are lucky, he will not have to pull a tooth. How do we avoid all of this? Professor Ye. V. Borovskiy, director of the polyclinic department of the Central Scientific Research Institute of Stomatology of the USSR Ministry of Health, answers this question for our correspondent Igor Dmitriyev.

[Dmitriyev] Yevgeniy Vlasovich, what would you say is the main feature of tooth ailments?

[Borovskiy] That they are widespread. Diseases of the teeth are among the most widespread on the planet.

Recall the influenza epidemic. The one that visits us every two or three years. The shops and institutions grow empty. It seems as if there is not a single person in the subway car or trolley bus who is not coughing or constantly pulling out a handkerchief. So what does this mean? At such times not more than 70 percent of the inhabitants of a city or an entire region are under the power of this infection, while the rest are protected by immunity acquired from previous epidemics. But when it comes to caries and periodontitis, the most widespread stomatological diseases, up to 100 percent of the planet's population suffers from them.

But the problem lies more than in just pain alone. Tooth ailments are insidious, behind them follows a train of serious complications—diseases of the stomach, kidneys, liver and nervous system, and malignant tumors of the oral cavity.

[Dmitriyev] A defense should be put up against such an enemy; has medicine created it?

[Borovskiy] I would be more cautious: It is creating, forming and improving it. Stomatologists are ignoring not a single discovery, not a single technical innovation along this road. As an example, anesthesia began its history in the dental office, and it was here that medical lasers were used for the first time. Our arsenal contains antibiotics, epoxy resins, resistant protective packing, and chemical mixtures that solidify in just seconds and then serve the patient well for decades. The modern dentist's drill, which now has attained a speed of 500,000 rpm, is truly a technical miracle.

The arsenal is large, but unfortunately it is clearly not being used adequately. With its help we could have already lowered stomatological morbidity by a factor of three to four.

[Dmitriyev] How?

[Borovskiy] By proceeding according to a perfected, comprehensive program, in which the main focus would be on preventing tooth ailments.

In fact, today a person goes to the dentist only when he feels pain. That is too late! In our attempts to rescue him we enter into a fight that we know has already been lost. Our crowns, fillings and therapeutic treatments are, if

you will, something akin to repairing a disintegrating blanket—darning, patching and so on. We need to act aggressively: Come out to meet the disease, intercept it at its own lines, and deal it a preemptive blow.

The experienced specialist will recognize the symptoms appearing in advance of a problem right away. It is relatively easy to establish them. But this requires continual contact between the stomatologist and his future patient. The individual should visit the dentist regularly, seeing him at least once every half-year. Moreover he should go to the dentist even when he is not experiencing any unpleasant sensations, not to mention pain.

[Dmitriyev] But is this realistic? In these days when time is short and schedules are full! Who could give several hours to a dentist, who would be so generous as to devote time to a visit which will more than likely end with the assertion that "everything is in order"?

[Borovskiy] But why not? Are you suggesting that we put more of a value on time than do the Americans? I doubt it. Yet, ever larger numbers of persons living in the USA visit the dentist regularly. How did this come about? The secret is simple: The press, television and radio in that country never tire of repeating a truth that goes something like this: "A preventive examination by a dentist will cost a few hours and up to \$30. Do not miss the opportunity, because tomorrow the price you will have to pay may be measured not in the hours but in the days, and not in the tens but in the hundreds of dollars...." And imagine, it works. The result is obvious as well: In the last few years the incidence of caries and periodontitis decreased there by three to four times. Shouldn't we do something similar to help ourselves?

Children are another matter—you cannot offer them such an alternative. We usually count on the help of nursery and elementary school teachers. Without being imposing, and following the rules of the game, they need to communicate the simple fundamentals of dental hygiene to the youngsters and help dentists during examinations conducted in groups and classrooms. This is precisely what they do abroad, and what is the result? In one recent survey in Switzerland's capital of Bern, almost half of 12 year old school children required no fillings. For comparison, adolescents in Moscow of the same age group have three to four bad teeth each, and moreover, they are far from always protected by fillings. Speaking honestly, we can congratulate our Swiss colleagues for such results and desire something better from ours.

[Dmitriyev] What other foreign accomplishments do you feel are worthy of use in our country?

[Borovskiy] You know, I am an opponent of blind copying. Something that might even be better somewhere else, and is doubtlessly of assistance, could be powerless in our country. Everything needs to be thought out and reconciled with our traditions, way of life, and finally, our economic possibilities.

For example we will unquestioningly continue providing free dental care to the socially unprotected strata of the population—students, retired persons, disabled persons (in the West, it is quite expensive). We will also develop paid services in parallel: If you want to pay more for faster service and higher quality, and more importantly, if you are able to, then do so with your own hard-earned money.

Rather than fluorinating all drinking water like they do in the USA, England, Sweden and other countries of the world, we will limit ourselves to another approach that I feel is less wasteful: We will produce fluorinated toothpaste and table salt. By the way, enterprises in the Ukraine and Byelarus have already organized production of such salt.

Because of the shortage of medical personnel, it's still too early to even talk about establishing a corps of dentist-hygienists—such specialists have appeared recently in countries of Europe and Africa. These are outgoing people who know how to persuade others by word and example, they attend specialized short courses, and they become dental assistants. They participate in mass examinations and in daily work with the population. If we could only do the same! If it becomes necessary in the future to upgrade our labor resources on a major scale, let us hope we think of the hygienists first. But for the moment we need to turn the most serious attention to educating those young stomatologists who will be replacing us. Our VUZ's [higher educational institutions] and schools accept many uncommitted people, often even after just a telephone interview. This is impermissible: A stomatologist, who essentially shapes the appearance of the individual, must be endowed with a creative gift to a no lesser degree than, for example, a sculptor or an artist. It is time to think about putting our applicants through competitions in creative work. And we need to support those young people who have been selected to succeed us, even if they have no interest in, let us say, literature or physics: We need to create the most favorable conditions for them.

[Dmitriyev] What are your recommendations to readers of PODMOSKOVYE?

[Borovskiy] Take care of your teeth, an invaluable gift of nature. Never use needles or paper clips as toothpicks. I shudder every time I see someone grinding his teeth against a Pepsi or Narzana bottle cap. Barbarism above all comparison!

Brush your teeth in the morning and evening, and not for the usual 10-15 seconds, but for three to four minutes. And do not forget regular visits to the dentist. In a word, put in a minimum amount of effort, and you will come out ahead, and your teeth will be ensured a long and healthy life. Good luck.

Blood Donor Compensation Increased

927C0368A Moscow KURANTY in Russian
7 Mar 92 p 3

[Article by Sergey Kapustin: "The Prices for Bread Are Rising and So Are the Prices for Blood"]

[Text] The prices for donated blood have risen again. Now 100 ml is 65 rubles [R]; for a one-time plasmapheresis procedure, they'll pay you R325, for a two-time procedure, twice that amount. Henceforth, isoimmune donors will get R1300 per liter. In addition, R30 each will be given to blood donors as a food allowance.

As we know, blood today is also going in exchange for goods. For example, at certain donor stations, those who donate blood for free are getting "humanitarian" coffee; at other stations, they get coupons to special stores for goods that are in short supply and at the "unrestrained" prices, but without having to stand in line. "You can 'let' your blood for buckwheat, margarine, flour, cheese, sour cream, vermicelli, salmon, and other delicacies," donors told me.

Donor Blood Shortage in Moscow

927C0368B Moscow KURANTY in Russian
18 Feb 92 p 3

[Article by Moscow Municipal Committee of the Society of the Red Cross: "There's Not Enough Blood in Moscow"]

[Text] In connection with the acute shortage of blood, the blood transfusion station of the Main Medical Board of Moscow is inviting people to give blood for monetary compensation at the following address: Polikarpov Street, Building 14, near the Begovaya subway station entrance. Sixty-five rubles will be paid for 100 ml of blood, plus 30 rubles for a food allowance after the blood is given.

Blood can be given between 0900 and 1400. The blood will be used for treating individuals in Moscow hospitals.

Birth Defects, Stillbirths and Neonatal Mortality Increase

927C0368C Moscow NEZAVISIMAYA GAZETA
in Russian 4 Mar 92 p 6

[Article picked up from the Studinformo service: "Municipal Chronicles"]

[Text] As reported by Olga Bruts, physician at the maternity ward in the Moscow Infectious Hospital No. 2, anomalies among newborns in 1991 were 180.5 pro mille (the number of children with anomalies per 1000 births). In 1990, that figure was 160.4. The number of stillbirths and deaths among newborns under seven days old was 43 pro mille in 1990; it was 32 in 1991. Olga Bruts feels that those figures are high, and that they may

drop in 1992, if only because of the decline in birthrate and the increase in number of abortions.

Blocker Antiproteins Patented As Cancer Treatment

927C0368D Moscow NEZAVISIMAYA GAZETA
in Russian 9 Apr 92 p 6

[Article by Yelena Arbuzova: "Antiprotein Against Cancer"]

[Text] The International Bureau of Patents has received a patent application from Russia. This time, the discovery is in the field of medicine—a new technique for treating cancers. Essentially, it involves the creation of a biological blocker-antiprotein that arrests the growth of the tumor. A course of treatment lasting one and a half months can result in a complete cure.

The technique, under development for 30 years, has been approved by domestic oncologists, and according to international reports, there is nothing like it in France, Britain, the United States, or Japan. It looks as if cancer will be conquered in this century yet.

Novel Disposable Syringe

927C0370A Moscow NEZAVISIMAYA GAZETA
in Russian 9 Apr 92 p 6

[Article by Lidiya Ivchenko: "No One Wants To Make Disposable Syringes: Production of Obsolete Models Cost \$120 Million"]

[Text] Two inventors, O. Zverev and P. Murashev, inventors of an original design of disposable syringes that cannot be reused no matter how hard you wished, visited dozens of organizations that in their opinion should have been interested in their invention, but unfortunately, such interest was never shown. Some saw their place as middlemen—perhaps they could sell them to someone somewhere else, and obtain a share of the profit, while others did not even show any curiosity at all.

But why was no one enthusiastic about this idea? Isn't it in our country that the need for such articles is especially high because of the poor quality of medical services? Could it be that the idea does not justify itself due to high cost or difficulties, and that it is unprofitable in its execution?

"Our article is only 10 percent more expensive than existing syringes," O. Zverev feels. "Besides designing a syringe that can truly be used only once, our goal was to make it as easy as possible to produce, so as to avoid major changes when retooling production. But as it turns out, all of that hard work was for nothing. The whole world is working on this idea: Such articles are being manufactured in France, although we still can't consider them to be self-destructing syringes. Such models are being produced in the USA, according to a radio report

some time ago; as it turns out, only in Russia is something of this sort not needed."

The developers are anxious and rightly so: They wasted time running in circles. In a month or so the patent-certifying institute will publish information on the new syringes in its publication and print the formula for their invention, and then any competent engineer in any country will be able to determine what's what without any difficulty, organize production, and receive the profit. In the meantime the authors of the idea are protected by a patent only in their own country, where they don't even have an experimental model: How could one be made without a production base? V. Zhukov, president of the Assistance Association, who has control over production of syringes, suggested that the authors make some experimental models and an experimental lot of the syringes, obtain permission from the Ministry of Health, and conduct clinical tests, after which they could come back to him to draw up a commercial agreement. Now that's assistance! If they could have done all of this themselves, what would they need the association for?

Whatever the case, Russia is the loser: It is without syringes, production of which it was unable to organize, and it is without the money that it could have obtained from the sale of licenses for their production abroad.

"We have already organized production of around a billion ordinary disposable syringes, having spent \$120 million on this," said I. Rybakov, president of the International Association for Medical Equipment. "What could we gain from shifting our resources?"

However, he did promise to find producers interested in manufacturing the new item anyway.

Drug Shortage Geographically Uniform, Says "Farmatsiya" Head

927C0370B Moscow ROSSIYSKAYA GAZETA
in Russian 24 Feb 92 p 4

[Interview with Nadezhda Kordina, director of the Yamalo-Nenets "Farmatsiya" Territorial-Production Enterprise, by correspondent Nataliya Yachmennikova; date and place not given: "Things Are Tough for Pharmacies in the North Also"]

[Text] A conference of Russian pharmacy workers was concluded yesterday in Moscow. Our correspondent met with one of the participants of the conference, N. A. Kordina, director of the Yamalo-Nenets "Farmatsiya" Territorial-Production Enterprise, on the eve of her flight home to Salekhard.

[Yachmennikova] Nadezhda Alekseyevna, do you feel that things are equally tough for Russia's pharmacies, or does geography make a certain imprint?

[Kordina] It's difficult for everyone. The discussion at this conference generally centered on survival of the

Russian pharmaceutical service. The causes of the desperate situation are well known: Disruption of economic ties, the absence of a balance between plans for medicine production and the availability of materials and equipment, the closing of a number of pharmaceutical enterprises and so on. There are few medicines available, while those which are available are getting more expensive, such that they are simply out of reach to many people; so we thought about what to do in this situation, about what steps to take.

When it comes to pharmacies in the Yamal region, in order to ensure simply normal existence in market conditions and in order to cover all expenses, we would have to add a trade mark-up of 300 percent to the price of medicine.

[Yachmennikova] Are you saying that the price of medicine needs to be raised by that amount?

[Kordina] Yes, but we of course would never opt for such a barbaric increase. It would mean leaving all of the okrug's population without medicine. Such prices are unacceptable, and they are contrary to common sense. The sole solution is subsidies. We are getting them, but they are continually decreasing; without subsidies, northern pharmacies will simply be unable to survive.

[Yachmennikova] We in Moscow go to pharmacies as a last resort. What about in the North?

[Kordina] Our commodity turnover has also decreased dramatically. That's understandable: People are trying to save money, and they have become more selective in their choice of drugs. In principle, this is gratifying. Before, you see, we received medicines by the ton, and all of these tons of medicine were consumed—not because we are all so sickly. Medicines were often purchased "just in case." One look into any home medicine cabinet would persuade you of the waste of tablets, mixtures and medicinal herbs. Unopened packages would simply be thrown into the trash after the expiration date.

[Yachmennikova] A surplus of medicines was a thing of the past. But how do we deal with things today, when you won't find simple pain relievers or fever-reducing tablets in the pharmacies no matter how hard you look?

[Kordina] Yes, the volume of medicines being produced has dropped almost by half. Foreign deliveries have decreased dramatically due to nonpayment of debts to foreign companies for medical preparations obtained in the last two years. As an example not a single contract has been signed yet with Hungary, from which we used to receive many vitally important drugs.

Unfortunately it seems to me that the situation will not be rectified quickly. For many long years our pharmaceutical industry was oriented chiefly on Western production: We supplied the raw materials, and they supplied us with medicines. As a result we do not have our own enterprises, or any modern processes, or any modern equipment.

[Yachmennikova] Nadezhda Alekseyevna, do you think that this conference will improve things?

[Kordina] I would like to hope that it would. Achieving the goals will require hard work, competency and stubbornness. I feel that the conference adopted a good concluding document containing specific proposals to the Russian government and to the corresponding enterprises and organizations aimed at fundamentally improving the supply of medicines to the population. A special role is reserved for privatization of pharmacies and improvement of the pharmacist training system. The main thing is for these proposals to be heard.

Health Ministers Sign Cooperation Accord

927C0372 Moscow NEZAVISIMAYA GAZETA
in Russian 8 Apr 92 p 6

[Article by Andrey Bayduzhiy: "Health Minister Come to Agreement on Cooperation: Individuals Will Have to Pay for Medical Service Performed in Another CIS State"]

[Text] A meeting of the chief health-service physicians and CIS [Commonwealth of Independent States] health ministers, called by the Belarus health minister, took place in Minsk. Discussions were held for two days regarding aspects of the coordination of cooperation among CIS member-countries in the field of medicine. After the breakup of the Union, its former members encountered the same difficulties: a shortage of drugs, a worsening of the ecological situation, and the health care sectors in chronic poverty. The transference of the borders and the cutback of appropriations for medicine are making it impossible for any one CIS country alone to solve those problems. As Russian health minister Andrey Vorobyev said, even Russia cannot solve the problems, and it was the country that came out of things in the most favorable position—most of the large medical centers and most of the plants for the production of medical equipment and drugs are located inside its borders.

The delegations from the states (with the exception of Turkmenistan, whose representatives did not attend the meeting) signed an agreement in which all the parties agreed to cooperate in terms of the exchange of medical information, the performance of joint programs, the development of standardized health norms, and the monitoring of the manufacture and use of drugs and medical equipment. One clause of the agreement is devoted to the obligation of the signers to help each other in dealing with the aftermaths of natural disasters, accidents, and emergencies—Chernobyl, the Aral region, and Semipalatinsk.

One of the principal outcomes of the meeting was the creation of a ministry-level CIS Council of States for Health Care, which Ukraine, Uzbekistan, and Azerbaijan did not join—their delegations, citing a lack of authority, refused to sign the agreement. Agreement was reached on the general principles for rendering medical

care in the CIS. Henceforth, free medical service in all the Commonwealth territory is guaranteed to all the citizens of other CIS states only for emergency care. In all other cases, the out-of-state residents will have to pay for medical service. Some types of services may remain free—and special bilateral agreements will be devoted to that.

Remaining outside the meeting's agenda, however, was the very important question of how the property of the former USSR Ministry of Health will be distributed. After the breakup of the Union, most of the CIS states could no longer make use of the services of large medical centers located in Moscow, and Russia lost its access to the Black Sea resorts. The next meeting of the ministers, which is slated for May, could be devoted to a discussion of that problem.

Nitrate Reductase as Target of Thermal Shock

927C0381A Moscow *DOKLADY AKADEMII NAUK SSSR in Russian* Vol 321 No 3, Nov 91 (manuscript received 07 Aug 91) pp 635-638

[Article by V. I. V. Kuznetsov, G. A. Ovcharenko, N. N. Borisova, S. Yu. Baskakova, and S. F. Izmaylov, Plant Physiology Institute imeni K. A. Timiryazev, USSR Academy of Sciences, Moscow; UDC 581.1]

[Abstract] The objective of this study was to investigate whether the role of targets of thermal shock may be performed by rate-limiting inducible enzymes, the inactivation of which in conditions of hyperthermia will switch off normal metabolism. A convenient system for testing this is the process of nitrate nitrogen assimilation, which is catalyzed by nitrate reductase, nitrite reductase, and glutamine synthetase. The key enzyme in this pathway is nitrate reductase, since it controls the first stage of the process, is independently regulated by the hormone and substrate, and is characterized by high lability. The results showed that the common corn cockle (*Agrostemma githago* L.) var. Gatersleben embryos reacted to the hormone nitrate reductase with an increase in enzyme activity. It was also shown that nitrite reductase and glutamine synthetase activities were the same both in the presence of the hormone and without it. The data demonstrated that increasing the incubation temperature of the embryos from 30 to 45°C completely stopped any further rises in nitrate reductase activity and actually prompted a steady decline in activity. Activity completely disappeared within four to five hours of the onset of thermal shock. These findings revealed that nitrite reductase and glutamine synthetase are very thermostable *in vivo* and do not limit the rate of assimilation of nitrate nitrogen in thermal shock. Thus, nitrate reductase alone performs the regulatory function in this case, and the rate-limiting function sharply rises in proportion to the duration of thermal shock. In conclusion, the selective and effective blocking of the expression of the nitrate reductase gene under conditions of hyperthermia permit this enzyme to be viewed as the target of thermal

shock. The inactivation of this enzyme as the temperature rises is accompanied by switching off the entire process of assimilating nitrate nitrogen. It is suggested that switching off normal metabolism in thermal shock is aimed at conserving the energy and structural resources of the cell and is possibly an adaptive mechanism. Figures 3; references 11: 3 Russian, 8 Western.

Ecology Center Opened in Vilnius

927C0396A Moscow *MEDITSINSKAYA GAZETA in Russian* 3 Apr 92 p 3

[Article based on reports by E. Grave, V. Zhuravlev, I. Evsikova, and L. Serdobolskaya; under the rubric "Briefly Noted"]

[Text] An Ecology Center has been opened in Vilnius: The Computer Land Company is the initiator and sponsor of this center. Any factory wishing to acquire special equipment can apply there for help to obtain information regarding ecological equipment produced abroad or advice. The United States has set aside 15 million dollars for the ecological needs of the Baltic countries; it will be necessary to dispose of this extremely small sum in a sensible way. The ecological situation in Lithuania is critical. When one of the factories there wanted to acquire equipment to measure the concentration of effluents, it turned out that instruments equipped to deal with this quantity of effluents were not even being produced abroad.

Turkish Aid to Uzbekistan

927C0396B Moscow *MEDITSINSKAYA GAZETA in Russian* 3 Apr 92 p 3

[Article based on reports by E. Grave, V. Zhuravlev, I. Evsikova, and L. Serdobolskaya; under the rubric "Briefly Noted"]

[Text] Airplanes are arriving almost every day at Tashkent airport from Ankara and Istanbul. Turkey is providing help to Uzbekistan worth 1,000 million dollars. This includes food products, medical preparations. These are being sent first of all to the indigent and to pediatric treatment institutions. A special team of rescuers and a group of highly qualified traumatologists are being sent from Uzbekistan to Turkey to participate in the elimination of the consequences of the earthquake. In addition, tents, blankets, first aid material, and medications are also being sent.

Medical Insurance Company Ensures Treatment Quality

927C0396C Moscow *MEDITSINSKAYA GAZETA in Russian* 3 Apr 92 p 3

[Article based on reports by E. Grave, V. Zhuravlev, I. Evsikova, and L. Serdobolskaya; under the rubric "Briefly Noted"]

[Text] The "Verteks" medical insurance company, recently formed in Saint Petersburg, is not only assuming responsibility for supervising treatment, but is also holding itself accountable to its clients for its quality. This feature favorably distinguishes [the activity of] "Verteks" from the activity of other medical insurance companies, which as a rule sell policies for several treatments and consultations for a specific period of time.

Epidemiologists Implement Air Quality Measures

927C0396D Moscow *MEDITSINSKAYA GAZETA*
in Russian 3 Apr 92 p 3

[Article based on reports by E. Grave, V. Zhuravlev, I. Evsikova, and L. Serdobolskaya; under the rubric "Briefly Noted"]

[Text] Spring has brought to the residents of Mary not only the joy of the awakening of nature, but a clear sky and clean air. The trail of poisonous yellow smog from the Turkmen nitrate fertilizer factory which had hung over the city for many years has disappeared. Under pressure from the public and the sanitary-epidemiological service, specialists of the firm have eliminated 36 sources of harmful gases and have installed efficient and reliable filters. The enterprises of the regional center have provided solid financial support for the implementation of the program to improve the ecology of the surrounding environment.

Medical Worker Strikes

Health Workers Strike in Moscow

927C0399A Moscow *ROSSIYSKAYA GAZETA*
in Russian 27 Apr 92 p 2

[Article by Lyudmila Arinicheva: "The Ministry of Health Is Warned..."]

[Text] The capital's physicians, nurses and orderlies have joined the Russia-wide medical worker strike. They are protesting against the sharp decrease in financing of the state public health budget.

Having no desire to play the role of pointmen, the capital's medical workers included in their strike demands an item concerning the program for safeguarding the health of the population. The people must know what forms of medical services will be left free of charge by the government and what services it is no longer financing and is asking patients to pay for themselves.

To avoid disaster tomorrow, today the capital's physicians are forced to do something which is undesirable in their opinion—to put pressure on the government of Moscow. During the first week of the strike they will treat patients as before, but they will refuse to issue certificates, hospital passes, and tickets to sanatoriums and health resorts. If their demands are not fulfilled, in the second week admissions of patients with hospital

appointments who do not require emergency aid will be halted. In the third stage—physicians hope very much that matters will not go this far—the plan is to stop providing health care except in emergencies. What is the government doing?

G. Popov and Yu. Luzhkov attended a reception with President B. Yeltsin in which among other matters, Moscow's budget was discussed. In turn the Russian Ministry of Health also seems to be showing some commitment—it is monitoring the situation. But the editor's office still does not have any information as to what practical measures will be implemented in order to support health care.

Low Medical Salaries in St. Petersburg Could Prompt Strike

927C0399B Moscow *MEDITSINSKAYA GAZETA*
in Russian 3 Apr 92 p 2

[Article by correspondent L. Serdobolskaya: "Every Strike Is Different"]

[Text] The beginning of the year was marked in St. Petersburg by a squall of various strikes: warning, two hour, and a strike in which work stations were moved to the square in front of the mayor's office. Taxi drivers, ambulance drivers, the urban transportation system, metro builders and metro operators have conducted strikes or threatened strikes. Their demands boiled down to a single main one—higher wages.

Among all of the strikers, there was one category that stood apart—medical workers. This was not just because they conducted their strikes without stopping work: The ambulance teams went out on calls, with the one difference that they parked their ambulances in the square in front of Smolny Palace, while planned operations were carried out in hospitals, and so on.

The main difference was in something else. The physicians tried to turn the attention of the city's authorities and inhabitants to the fact that without adequate support to health care, they will not be able to provide the necessary assistance to the people; they decided upon this measure when the real danger appeared that they would not be able to fulfill their professional obligations, when emergency operations began to be postponed one after another.

Surprising though it may be, it is a fact that the taxi drivers have upheld their rights, and the workers of urban ground transportation and the metro operators have done so as well. But what about the physicians? Nothing at all. The number of postponed planned hospitalizations is increasing throughout the city.

Now a few figures. A metro mechanic receives 14 times the minimum monthly salary, workers of ground transportation receive a little less, but among those who receive 10 or less times the minimum salary, teachers

receive 2.6, and physicians get 2.1. They say that the shift work of metro workers is associated with high responsibility for the life of other people. Well, you must excuse me, but the labor of public health workers is no less responsible, and they also have their "night shift." Why such a difference in wages? Could it be that medical workers also needed to strike for higher wages rather than in defense of the interests of patients?

Omsk Ambulances To Strike

927C0399C Moscow SOVETSKAYA ROSSIYA
in Russian 23 Apr 92 p 2

[Article by A. Petrov: "Ambulances on Strike"]

[Text] An ITAR-TASS correspondent reports that workers of the Omsk First and Emergency Medical Aid Station plan to strike for an indefinite period of time beginning on 25 April.

As of 0830 on this day, "03" calls will no longer be answered, and the central dispatch office will be shut down to cut off direct communication with ambulance teams. All personnel will remain in their quarters without their lab coats, and they will not respond to any calls, no matter how serious they may be.

"We adopted the demands of the All-Russian Ambulance Strike Committee as our basis," announced the city committee's leader V. Devonin, a physician specializing in resuscitation.

Tyumen Medical Workers Announce Strike

927C0399D Moscow MEDITSINSKAYA GAZETA
in Russian 3 Apr 92 p 2

[Article by A. Vladimirtseva: "We Do Not Want To Be Wasteful Anymore"]

[Text] Medical workers of City Hospital No 2, the largest in Tyumen, have announced a strike beginning on 6 April. For 49 days prior to this they were in a state anticipatory to this strike, acting strictly according to the law and insisting on intervention by a reconciliation commission and on labor arbitration. Unfortunately no reaction followed from the city administration. The oblast trade union of medical workers also maintained a noble neutrality. Even though City Hospital No 2 is petitioning not at all for itself alone, but for all of extremely impoverished public health in Tyumen, together with all of its financial imbalances. Given a tenfold overall increase in the hospital budget, 31 times more has to be paid for water and 17 times more has to be paid for food for patients, at the same time that the wages of physicians and nurses have been increased by only a factor of two.

It was not that easy for a surgical hospital that works seven days a week to dare to strike. But it had to. As chief physician S. Marchenko said, "We do not want to be wasteful anymore." However, the physicians have not abandoned their patients: It has been strictly stipulated

precisely to which hospitals emergency patients will be sent during these days. The pediatric department is totally exempt from the protest action. The chairman of the strike committee, anesthesiologist Sergey Minetsev, informed the press office that patients are avidly supporting the physicians. A decision has been made to see it to the end, until complete satisfaction of all of the demands of the medical workers.

Moscow Ambulances on Strike

927C0399E Moscow MEDITSINSKAYA GAZETA
in Russian 24 Apr 92 p 8

[Article by Valeriy Sankov: "'03' May Not Respond to Calls"]

[Text] Russian medical workers plan to begin an all-Russian protest action against the disastrous state of public health on 27 April. In particular, according to M. Kuzmenko, director of the public health workers trade union, 70 to 80 percent of ambulances are in disrepair. Physicians of the Moscow emergency aid station are also considering a strike.

Five thousand patients and victims (the statistical average number of calls per day) will be left without medical care. Is such a form of struggle for higher wages humane?

Dmitriy Merkulov, chief physician of Moscow's emergency aid station:

"Let me make it clear that our demands include not only higher wages but also improvement of the station's material and equipment base, and higher allocations for medicines and equipment. Yes, we have never engaged in this form of protest, and even now it is difficult to accept it as the result of the fight the strike committee has waged for half a year. But I see no other solution.

"What can I as a chief physician do to satisfy these requirements? Nothing. Neither the Russian nor the Moscow government has any money for emergency aid. It might be supposed from the neglected state in which we find emergency aid that no one needs it.

"Of Moscow's 46 substations, only 12 were built according to plans drawn up specifically for this purpose. The rest occupy space in former barracks, day care centers and hospitals, and apartments in the first stories of residential buildings. These are cramped, ill-suited cubicles in which not only is it impossible to lie down to rest, but also it is sometimes impossible to even sit down. Some substations don't even have hot water. Moreover emergency aid substations were not included at all in plans for new districts of Moscow, each with a population of 100,000 to 200,000. Before, it cost 500,000 rubles to build substations on the basis of standard plans, and even so, they were not built, while now they cost R40 to 50 million. Where is the money to come from?

"Yes, we understand that the state has very limited resources. But we cannot condone the absence of elementary medicines and dressings in the emergency aid physician's bag.

"The best specialists are leaving the emergency aid system: Of 3,000 physicians, 1,800 remain. As I understand, the strike should attract attention to our problems. It is in this way that it is humane."

Leon Akopov, strike committee chairman, director of the Central Emergency Aid Substation:

"The strike committee announced the strike as of 1 February. On 18 March Moscow's Vice Mayor Yuriy Luzhkov signed the 'Order for Additional Measures To

Improve the Work of First and Emergency Medical Aid.' Unfortunately it can help to fulfill the demands of the station's collective only in part.

"We are told that medical workers do not have the right to strike. But according to legislation currently in force, 'cessation of work as a means of resolving a labor dispute or conflict is not permitted if this creates a danger to the life and health of people....' The refusal of emergency aid workers to work does not create a danger to the life and health of Moscow's residents. We will simply no longer be safeguarding their life and health. But let them also know the kind of conditions in which we work, and let them help us, as well as themselves."

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